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Education:

University of Minnesota	BS	1970	Studio Art
University of Minnesota	BS	1973	Biology
University of Minnesota	PhD	1980	Biochemistry

Professional Experience:

Biochemist Argonne National Laboratory, Environmental Research Division, Argonne National Laboratory (1992-present)

Scientist Amoco Technology Company, Naperville, Illinois (1986-92)

Postdoctoral Investigator (Dr. Ralph Wolfe)
University of Illinois, Urbana-Champaign, Illinois (1983 - 1986)

Postdoctoral Investigator (Dr. Fred Hartman)
Oak Ridge National Laboratory, Biology Division, Oak Ridge, Tennessee (1981 - 1983)

Awards/Professional Activities

Societies:

American Chemical Society, Member since 1983
American Society for Microbiology, Member since 1983

Awards:

Fulbright-Hays Grant for Graduate Study Abroad. University of Leicester, UK (1979-80)
R&D100 Award, Production of chemicals from biologically derived succinic acid (1997)

PATENTS

Donnelly, M.I., Millard, C.S, and Nghiem, N. Method to produce succinic acid from raw hydrolysates. USPTO Patent 6,743,610, June 1, 2004.

Donnelly, M.I., and Joachimiak, A. Methods for production of proteins in host cells. USPTO 6,677,139, Jan. 13, 2004.

Donnelly, M.I., Eschenfeldt, W.H., and Trent, J.T., Novel 2,5-diketo-D-gluconic acid reductases and methods of use. USPTO 6,576,452, June 10, 2003.

Donnelly, M.I., Chatterjee, R., Millard, C.S. Method for construction of bacterial strains with increased succinic acid production. USPTO Patent 6,159,738, Dec. 12, 2000.

Ngheim, N.P., Donnelly, M.I., Millard, C.S., and Stols, L. Method for the production of dicarboxylic acids. USPTO Patent 5,869,301, Feb. 9, 1999.

Donnelly, M.I., Millard, C.S., and Stols, L. Mutant *Escherichia coli* strain with increased production of succinic acid. USPTO Patent 5,770,435, Jun. 23, 1998.

REFERRED PUBLICATIONS

Eirich, L. D., D. L. Craft, L. Steinberg, A. Asif, W. H. Eschenfeldt, L. Stols, M. I. Donnelly, and C. R. Wilson (2004) Cloning and Characterization of Three Fatty Alcohol Oxidase Genes from *Candida tropicalis* Strain ATCC 20336. *Appl. Environ. Microb.* 70, 4872-4879.

Stols, L., C. Sanville Millard, I. Dementieva, and M. I. Donnelly (2004) Production of selenomethionine-labeled proteins in two-liter plastic bottles for structure determination. *J. Struct. Funct. Genomics* 5, 95-102.

Millard, C.S., Stols, L., Quartey, P., Kim, Y., Demetieva, I., and Donnelly, M.I. (2003) A less laborious approach to the high-throughput production of recombinant proteins in *Escherichia coli* using 2-liter plastic bottles. *Prot. Express. Purif.* 29, 311-320.

Eschenfeldt, W. H., Y. Zhang,, H. Samaha, L. Stols, L. D. Eirich, C. R. Wilson, and M. I. Donnelly (2003) Transformations of Fatty Acids Catalyzed by Cytochrome P450 Monooxygenase Enzymes of *Candida tropicalis*. *Appl. Environ. Microb.* 69, 5992-5999.

Stols, L., M. Gu, L. Dieckman, R. Raffen, F.R. Collart, and M.I. Donnelly (2002) A New Vector for High Throughput, Ligation Independent Cloning Encoding a TEV Protease Cleavage Site. *Prot. Expr. Purif.* 25, 8-15.

Dieckman, L., Gu, M., Stols, L., Donnelly, M.I., and Collart, F.R (2002) High Throughput Methods for Gene Cloning and Expression, *Prot. Expr. Purif.* 25, 1-7.

Eschenfeldt, W.H., L. Stols, H. Rosenbaum, Z. S. Khambatta, E. Quaite-Randall, S. Wu, D.C. Kilgore, J.D. Trent, and M.I. Donnelly (2001) DNA from Uncultured Organisms as a Source of 2,5-Diketo-D-Gluconic Acid Reductases. *Appl. Environ. Microb.* 67, 4206-4214.

Donnelly, M.I., P. Wilkins Stevens, L. Stols, S. X. Su, S. Tollaksen, C.S. Giometti, and A. Joachimiak (2001) Expression of a Highly Toxic Protein, Bax, in *Escherichia coli* by Attachment of a Leader Peptide Derived from the GroES Co-chaperone. *Protein Expr. Purif.* 22, 422-429.

Chatterjee, R., C. S. Millard, K. M. Champion, D. P. Clark, and M. I. Donnelly (2001) Mutation of the *ptsG* Gene Results in Increased Production of Succinate in the Fermentation of Glucose by *Escherichia coli*. *Appl. Environ. Microb.* 67, 148-154.

Donnelly, M.I., Sanville, C.M., Clark, D.P., Chen, M.J., and Rathke, J.W. (1998) A new fermentation pathway to succinic acid in a mutant *Escherichia coli*. *Appl. Biochem. Biotechnol.* 70-72, 187-198.

- Stols, L. and Donnelly, M.I. (1997) Production of succinic acid through overexpression of NAD⁺ dependent malic enzyme in an *Escherichia coli* mutant. *Appl. Environ. Microbiol.* **63**, 2695-2701.
- Stols, L., Kulkarni, G., Harris, B.G., and Donnelly, M.I. (1997) Expression of *Ascaris suum* malic enzyme in a mutant *Escherichia coli* allows production of succinic acid from glucose. *Appl. Biochem. Biotechnol.* **63-65**, 153-158.
- Millard, C.S., Chao, Y.-P., Liao, J.C., and Donnelly, M.I. (1996) Enhanced production of succinic acid by overexpression of phosphoenolpyruvate carboxylase in *Escherichia coli*. *Appl. Environ. Microbiol.* **62**, 1808-1810.
- Boernke, W.E., Millard, C.M., Wilkins-Stevens, P., Stevens, F.J., and Donnelly, M.I. (1995) Stringency of substrate specificity of *Escherichia coli* malate dehydrogenase. *Arch. Biochem Biophys.* **322**, 43-52.
- Weaver, T.M., Levitt, D.G., Wilkins Stevens, P., Donnelly, M.I., and Banaszak, L.J. (1995) The multisubunit active site of fumarase C from *Escherichia coli*. *Nature Struct. Biol.* **2**, 654-662.
- Muslin, E.H., Li, D., Stevens, F.J., Donnelly, M.I., Schiffer, M, and Anderson, L.E. (1995) Engineering a domain-locking disulfide into a bacterial malate dehydrogenase produces a redox-sensitive enzyme. *Bioophys. J.* **68**, 2218-2223.
- Rataj, M.J., Kauth, J.E., and Donnelly, M.I. (1991) Oxidation of deuterated compounds by high specific activity methane monooxygenase from *methyllosinus trichosporium*: Mechanistic implications. *J. Biol. Chem.* **266**, 18684-18690.
- Ruzicka, F., Huang, D.-S., Donnelly, M.I., and Frey, P.A. (1990) Methane monooxygenase catalyzed oxidation of 1,1-dimethylcyclopropane. Evidence for radical and carbocation intermediates. *Biochemistry* **29**, 1696-1700.
- Noll, K.M., Donnelly, M.I., and Wolfe, R.S. (1987) Biochemical aspects of methane formation in *Methanobacterium thermoautotrophicum*. *Antonie Van Leeuwenhoek J. Microbiol. Serol.* **53**, 15-21.
- Hartzell, P.L., Donnelly, M.I., and Wolfe, R.S. (1987) Incorporation of coenzyme M into component C of methylcoenzyme M methylreductase during *in vitro* methanogenesis. *J. Biol. Chem.* **262**, 5581-5586.
- Bobik, T.A., Donnelly, M.I., Rinehart, K.L., Jr., and Wolfe, R.S. (1987) Structure of a methanofuran derivative found in cell extracts of *Methanosarcina barkeri*. *Arch Biochem. Biophys.* **254**, 430-436.
- Noll, K.M., Donnelly, M.I., Rinehart, K.L., Jr., and Wolfe, R.S. (1987) Synthesis of 7 mercaptoheptapolylethreonine phosphate and its activity in the methylcoenzyme M methylreductase system. *J. Biol. Chem.* **262**, 513-515.
- Dimarco, A.A., Donnelly, M.I., and Wolfe, R.S. (1986) Purification and properties of the 5,10 methenyltetrahydromethanopterin cyclohydrolase from *Methanobacterium thermoautotrophicum*. *J. Bacteriol.* **168**, 1372-1377.
- Donnelly, M.I. and Wolfe, R.S. (1986) The role of formylmethanofuran:tetrahydromethanopterin formyltransferase in methanogenesis from carbon dioxide. *J. Biol. Chem.* **261**, 166532-16659.

Donnelly, M.I., Escalante-Semerena, J.C., Rinehart, K.L., Jr., and Wolfe, R.S. (1985) Methenyl tetrahydromethanopterin cyclohydrolase in cell extracts of *Methanobacterium*. *Arch. Biochem. Biophys.* **242**, 430-439.

Hartzell P.L, Zvilius, G., Escalante-Semerena, J.C., and Donnelly, M.I. (1985) Coenzyme F420 dependence of the methylenetetrahydromethanopterin dehydrogenase of *Methanobacterium thermoautotrophicum*. *Biochem. Biophys. Res. Commun.* **133**, 884-90.

Jones, W.J., Donnelly, M.I., and Wolfe, R.S. (1985) Evidence of a common pathway of carbon dioxide reduction to methane in methanogens. *J. Bacteriol.* **164**, 126-131.

Donnelly, M.I., Hartman, F.C., and Ramakrishnan, V.R. (1984) The shape of ribulosebisphosphate carboxylase/oxygenase in solution as inferred from small angle neutron scattering. *J. Biol. Chem.* **259**, 406-411.

Donnelly, M.I., Stringer, C.D., and Hartman, F.C. (1983) Characterization of the activator site of *Rhodospirillum rubrum* ribulosebisphosphate carboxylase/oxygenase. *Biochemistry* **22**, 4346-4352.

Hartman, F.C., Stringer, C.D., Omnass, J., Donnelly, M.I., and Fraij, B. (1982) Purification and sequencing of cyanogen bromide fragments from ribulosebisphosphate carboxylase/oxygenase from *Rhodospirillum rubrum*. *Arch. Biochem. Biophys.* **219**, 422-437.

Donnelly, M.I., and Hartman, F.C. (1981) Inactivation of ribulosebisphosphate carboxylase/oxygenase for *Rhodospirillum rubrum* and spinach with the new affinity label 2-bromo-1,5-dihydroxy-3-pentanone 1,5-bisphosphate. *Biochem. Biophys. Res. Comm.* **103**, 161-167.

Donnelly, M.I., Chapman, P.J., and Dagley, S. (1981) Bacterial degradation of 3,4,5-trimethoxyphenylacetic and 3-ketogluutaric acids. *J. Bacteriol.* **147**, 471-476.

Donnelly, M.I., and Dagley, S. (1981) Bacterial degradation of 3,4,5-trimethoxycinnamic acid with production of methanol. *J. Bacteriol.* **147**, 471-476.

Donnelly, M.I., and Cooper, R.A. (1981) A second, nicotinamide adenine dinucleotide-dependent succinic semialdehyde dehydrogenases in *Escherichia coli* K12 grown on gamma-aminobutyrate. *J. Bacteriol.* **145**, 1425-1427.

Donnelly, M.I., and Cooper, R.A. (1981) Succinic semialdehyde dehydrogenases of *Escherichia coli*: Their role in the degradation of para-hydroxyphenylacetic acid and gamma-aminobutyrate. *Eur. J. Biochem.* **113**, 555-561.

Donnelly, M.I., and Dagley, S. (1980) Production of methanol from aromatic acids by *Pseudomonas putida*. *J. Bacteriol.* **142**, 916-924.

REVIEWS AND INVITED PRESENTATIONS

Ngheim, N., Davison, B.H., Donnelly, M.I., Tsai, S.P., Frye, J.G. (2001) An integrated process for the production of chemicals from biologically derived succinic acid. *In* Chemicals and Materials from Renewable Resources, ACS Symposium Series 784, American Chemical Society, Washington, DC, pp. 133-146.

Donnelly, M.I., Chatterjee, R., Millard, C.S., Champion, K. M., and Clark, D.P. (1999) A mutation in *Escherichia coli* that allows fermentation of glucose to succinic acid, acetic acid, and ethanol. Invited symposium presentation, 50th Annual Meeting, Society of Industrial Microbiology, Arlington, VA, Aug. 1-5, 1999.

Millard, C.S., Stols, L., Liao, J.C., and Donnelly, M.I. (1995) Enhanced production of dicarboxylic acids through metabolic engineering. Invited symposium presentation, Society for Industrial Microbiology/American Chemical Society Symposium, *Recent Advances in Fermentation Technology*, San Diego, CA, November 4-7, 1995.

Donnelly, M.I., and Wolfe, R.S. (1988) Enzymes, coenzymes, and intermediates of methanogenesis from carbon dioxide. In *Microbial Metabolism and the Carbon Cycle*, Hagedorn, S.R., Hanson, R.S., and Kunz, D.A. (eds.), Harwood Academic Publishers, pp. 227-244.

Donnelly, M.I., Ramakrishnan, V.R., and Hartman, F.C. (1984) Chemical and physical characterization of the activation of ribulosebisphosphate carboxylase/oxygenase, In *Advances in Photosynthesis Research*, Vol III, Sybesma, C. (ed.), Martinus Nijhoff/Dr. W. Junk Publishers, The Hague, The Netherlands, pp. 739-742.